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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/005,643	12/05/2001	Fred G. Benkley III	M01059.70000US	8242

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EXAMINER	
CARTER, AARON W	

ART UNIT	PAPER NUMBER
2625	14

DATE MAILED: 11/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/005,643	BENKLEY, FRED G.	
	Examiner	Art Unit	
	Aaron W Carter	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19,35-69 and 71-87* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19,35-69 and 71-87* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8,9,10,12*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *10/21/2004* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with William R. McClellan (Reg. No. 29,409) on October 21, 2004.

The application has been amended as follows:

Cancel claims 20-34 and 70.

DETAILED ACTION

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-9, 12-19, 67, 69, 73, 74, 76-78 and 82-86 are rejected under 35 U.S.C. 102(e) as being anticipated by USPN 6,643,389 to Raynal et al. ("Raynal").

As to claim 1, Raynal discloses an image sensing apparatus comprising:

At least one image pickup plate disposed generally laterally with respect to a direction of movement of an object (Fig. 1, 2 and 3 and column 4, lines 58-67, wherein the senor array, element 13, comprises multiple cells each containing a first and second capacitor one of which corresponds to the image pickup plate and the other corresponds to the image drive plate); and

A plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps, wherein features of the object passing over said sensor gaps produce a change in capacitance between respective image drive plates and said image pickup plate (column 4, lines 60-67 and Fig. 3, elements 35 and 37).

As to claim 2, Raynal discloses the image sensing apparatus as defined in claim 1, wherein said at least one image pickup plate and said plurality of image drive plates are dimensioned and spaced for sensing a fingerprint (column 3, lines 31-37).

As to claim 3, Raynal discloses the image sensing apparatus as defined in claim 2, wherein a spacing between each of said image drive plates and said image pickup plates is less than about one half of the ridge spacing on a typical fingerprint (column 3, lines 65-67, wherein if each cell is smaller than the width of a ridge and each cell contains an image drive and pickup plate spaced apart then it is inherent that the distance between them in "less than about half of the ridge spacing" on a typical fingerprint).

As to claim 4, Raynal discloses the image sensing apparatus as defined in claim 2, wherein a spacing between each of said image drive plates and said image pickup plate is less than about one half of the ridge spacing on a typical fingerprint (column 3, lines 61-67).

As to claim 5, Raynal discloses the image sensing apparatus as defined in claim, wherein said image drive plates comprise parallel conductors disposed perpendicular to said image pickup plate and spaced from said image pickup plate by respective sensor gaps (Fig. 2 and 3).

As to claim 6, Raynal discloses the image sensing apparatus as defined in claim 1, wherein said at least one image pickup plate comprises two or more image pickup plates disposed generally laterally with respect to the direction of movement of the object (Fig. 1, 2 and 3, wherein the sensor array, element 13 comprises multiple cells each of which comprises an image pickup plate).

As to claim 7, Raynal discloses the image sensing apparatus as defined in claim 2, including at least about 250 image drive plates (column 3, lines 40-47).

As to claim 8, Raynal discloses the image sensing apparatus as defined in claim 1, further comprising a substrate, wherein said at least one image pickup plate and said plurality of image drive plates comprise conductive traces on said substrate (Fig. 2 and column 4, lines 40-57).

As to claim 9, Raynal discloses the image sensing apparatus as defined in claim 8, wherein said substrate comprises a printed circuit board (Fig. 2 and column 3, lines 36-37).

As to claim 12, Raynal discloses the image sensing apparatus as defined in claim 1, further comprising:

An excitation circuit for sequentially energizing said image drive plates with drive signals (column 4, lines 7-14, wherein power supply and scan control correspond to excitation circuit), and

A detection circuit for detecting the drive signals capacitively coupled from said image drive plates to said image pickup plate to provide image signals (column 4, lines 22-24, wherein A/D converter and Output logic corresponds to detection circuit).

As to claim 13, Raynal discloses the image sensing apparatus as defined in claim 12, wherein said drive signals comprises sequential signal bursts applied to respective one of said image drive plates (column 4, lines 7-14 and column 5, lines 14-37).

As to claim 14, Raynal discloses the image sensing apparatus as defined in claim 13, wherein the excitation circuit includes for coupling non-energized drive plates to a reference potential (column 4, lines 7-14 and column 5, lines 14-37, wherein reference voltage corresponds to reference potential).

As to claim 15, Raynal discloses the image sensing apparatus as defined in claim 13, wherein said signal bursts comprise bursts of a clock signal (column 4, lines 1-6, wherein the scanning rate corresponds to a clock signal based on finger movement speed, see also column 2, lines 50-58).

As to claim 16, Raynal discloses the image sensing apparatus as defined in claim 13, wherein said detection circuit comprises a synchronous detector for providing pulses in response to the detected signal bursts (column 4, lines 1-6).

As to claim 17, Raynal discloses the image sensing apparatus as defined in claim 16, further comprising an A/D converter for converting said pulses to digital values, a memory and a processor for storing the digital values in said memory (column 4, lines 22-39).

As to claim 18, Raynal discloses the image sensing apparatus as defined in claim 17, wherein said processor initiates a plurality of sequential line scans of said image drive plates to provide a plurality of line scans along lines of the moving object (column 4, lines 1-6 and 22-39).

As to claim 19, Raynal discloses the image sensing apparatus as defined in claim 12, wherein said detection circuit includes an amplifier for receiving the capacitively coupled drive signals, said amplifier having a gain that is an inverse function of the amplitude of the capacitively coupled drive signals (column 4, lines 58-67 and column 5, lines 14-37).

As to claim 67, Raynal discloses a fingerprint sensing method, comprising the steps of:

Capacitively sensing ridge peaks and ridge valleys of a fingerprint (Fig. 3) on a swiped finger with a linear array of capacitive sensors and providing image signals representative of a line of the fingerprint (Fig. 1); and

Acquiring from the linear array of capacitive sensors image signals representative of multiple lines of the fingerprint (Fig. 4) to provide a fingerprint image (column 5, lines 38-47).

As to claim 69, Raynal discloses the image sensing apparatus as defined in claim 1, wherein said at least one image pickup plate and said plurality of image drive plates are substantially coplanar (Fig. 2 and 3).

As to claim 73, please refer to rejections made for claims 1 and 69 above.

As to claim 74, Raynal discloses a capacitive sensor as defined in claim 73, wherein said pickup plate and said plurality of drive plates comprise conductive traces on a substrate (column 4, lines 40-57).

As to claim 76, please refer to the rejections made for claim 2 above.

As to claim 77, Raynal discloses a capacitive sensor as defined in claim 73, wherein said array of sensor gaps comprises a linear array (Fig. 1 and 2).

As to claim 78, Raynal discloses a capacitive sensor as defined in claim 76, wherein said sensor gaps have dimensions of about 25-50 micrometers (column 3, lines 65-67).

As to claim 82, Raynal discloses a fingerprint sensing apparatus comprising:

an image sensor comprising an image pickup plate disposed generally laterally with respect to a direction of movement of a finger (Fig. 1, 2 and 3, wherein the sensor array, element 13 comprises multiple cells each of which comprises an image pickup plate); and a plurality of image drive plates in spaced relation to said image pickup plate to define the plurality of sensor gaps, wherein said image pickup plate and said plurality of image drive plates are fabricated on a substrate (column 4, lines 60-67 and Fig. 3, elements 35 and 37); and

A sensor circuit, separate from said substrate (Fig. 2, elements 27 and 31), for excitation of said image sensor with image drive signals and for detection of image signals generated by said image sensor in response to said image drive signals (column 4, lines 7-14, wherein power supply and scan control correspond to excitation circuit and column 4, lines 22-24, wherein A/D converter and Output logic corresponds to detection circuit).

As to claim 83, please refer to the rejections made for claim 69 above.

As to claim 84, please refer to the rejections made for claim 1 above.

As to claim 85, please refer to the rejections made for claim 77 above.

As to claim 86, please refer to the rejections made for claim 69 above.

4. Claims 35, 64-66 and 68 are rejected under 35 U.S.C. 102(e) as being anticipated by USPN 6,785,407 to Tschudi et al. ("Tschudi").

As to claim 35, Tschudi discloses a fingerprint sensing system comprising:

An image sensor comprising a linear array of capacitive sensors for capacitive sensing of ridge peaks and ridge valleys of a fingerprint on a moving finger (column 2, lines 6-9 and lines 58-63);

a rate sensor for sensing a speed of the finger as it moves across said image sensor (column 3, lines 34-40 and column 4, lines 15-20); and

A sensor circuit for excitation of said image sensor with image drive signals and for detection of image signals in response to said image drive signals (column 2, line 65 – column 3, line 3), for excitation of said rate sensor with rate drive signals and for detection of rate signals in response to said rate drive signals (column 3, lines 34-40 and column 4, lines 15-20), and for coordinating said image signals and said rate signals to provide a fingerprint image (column 3, lines 20-28).

As to claim 64, Tschudi discloses a fingerprint sensing system as defined in claim 35, further comprising a substrate, wherein said image sensor and said rate sensor are fabricated on said substrate (column 4, lines 59-63).

As to claim 65, Tschudi discloses a fingerprint sensing system as defined in claim 64, wherein said substrate comprises a flexible substrate (column 3, lines 49-58).

As to claim 66, Tschudi discloses a fingerprint sensing system as defined in claim 64, wherein said sensor circuit is mounted on said substrate (column 4, lines 59-63).

As to claim 68, please refer to rejections made for claim 35 above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 10, 11 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raynal in view of Tschudi.

As to claim 10, Raynal discloses the image sensing apparatus as defined in claim 8.

Raynal does not disclose expressly wherein said substrate comprises a flexible substrate.

Tschudi discloses a an image sensing apparatus comprising a flexible substrate (column 3, lines 49-58 and column 4, lines 5-14).

Raynal & Tschudi are combinable because they are from the same fields of image processing in particular fingerprint image sensing through the use of capacitance.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the image sensing apparatus of Raynal with the image sensing substrate as taught by Tschudi.

The suggestion/motivation for doing so would have been that the flexible substrate provides measurements of a larger area of the finger print surface than linear or flat devices (Tschudi, column 3, lines 52-54).

Therefore, it would have been obvious to combine Raynal with Tschudi to obtain the invention as specified in claim 10.

As to claim 11, the combination of Raynal and Tschudi discloses the image sensing apparatus as defined in claim 10, further comprising a substrate support, wherein said flexible substrate is affixed to said substrate support and wherein said substrate support has a contour selected to substantially match the contour of a typical finger (column 3, lines 49-58 and column 4, lines 5-14).

As to claim 75, please refer to the rejections made for claim 10 above.

7. Claims 36-63, 71, 72, 79-81 and 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tschudi in view of Raynal.

As to claim 36, Tschudi discloses the fingerprint sensing system as defined in claim 35.

Tschudi does not disclose expressly the specific details of the image sensor comprising:

At least one image pickup plate disposed generally laterally with respect to a direction of movement of the finger; and

A plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps, wherein ridge peaks and ridge valleys of the fingerprint passing over said sensor gaps produce a change in capacitance between respective image drive plates and said image pickup plates.

However, Raynal discloses an image sensor comprising:

At least one image pickup plate disposed generally laterally with respect to a direction of movement of the finger (Fig. 1, 2 and 3 and column 4, lines 58-67, wherein the senor array, element 13, comprises multiple cells each containing a first and second capacitor one of which corresponds to the image pickup plate and the other corresponds to the image drive plate); and

A plurality of image drive plates in spaced relation to said image pickup plate to define a plurality of sensor gaps, wherein ridge peaks and ridge valleys of the fingerprint passing over said sensor gaps produce a change in capacitance between respective image drive plates and said image pickup plates (column 4, lines 60-67 and Fig. 3, elements 35 and 37).

Tschudi & Raynal are combinable because they are from the same field of image processing and more specifically in the same field of fingerprint image sensing through the use of capacitance.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the structure of detecting a change in capacitance between an image drive and

pickup plate as disclosed by Raynal with the fingerprint image sensing system disclosed by Tschudi.

The suggestion/motivation for doing so would have been that the use of the sensing element disclosed by Raynal is that the electrical detection devices have the advantage of being less subject to moisture problems (column 1, lines 49-53), as well as the narrow array device is less expensive (column 2, lines 59-62).

Therefore, it would have been obvious to combine Tschudi with Raynal to obtain the invention as specified in claim 36.

As to claim 37, please refer to the rejection made for claim 3 above.

As to claim 38, please refer to the rejection made for claim 4 above.

As to claim 39, please refer to the rejections made for claim 5 above.

As to claim 40, please refer to the rejection made for claim 6 above.

As to claim 41, please refer to the rejection made for claim 7 above.

As to claim 42, please refer to the rejection made for claim 8 above.

As to claim 43, please refer to the rejection made for claim 10 above.

As to claim 44, please refer to the rejection made for claim 11 above.

As to claim 45, please refer to the rejection made for claim 12 above.

As to claim 46, please refer to the rejection made for claim 13 above.

As to claim 47, please refer to the rejection made for claim 14 above.

As to claim 48, please refer to the rejection made for claim 16 above.

As to claim 49, please refer to the rejection made for claim 17 above.

As to claim 50, please refer to the rejection made for claim 18 above.

As to claim 51, please refer to the rejection made for claim 19 above.

As to claim 52, the combination of Tschudi and Raynal disclose a fingerprint sensing system as defined in claim 35, while Tschudi discloses a rate sensor comprising two or more finger detectors spaced apart along a direction of movement of the finger used to detect a change in capacitance (column 2, line 65 – column 3, line 3, column 3, lines 35-40 and 4, lines 15-20), however does not give the specific details of how the change in capacitance is determined. Raynal further discloses two or more detectors (Fig. 2, elements 21) including at least one drive plate and at least one pickup plate (Fig. 3, elements 35 and 37), wherein an end of a finger passing over each of said finger detectors produces a change in capacitance between drive plates and pickup plates (column 5, lines 10-14).

As to claim 53, please refer to the rejections made for claim 1 above.

As to claim 54, the combination of Tschudi and Raynal disclose a fingerprint sensing system as defined in claim 52, Raynal further discloses wherein the rate pickup plates of the finger detector are commonly connected (Fig. 2 and 3, wherein each cell contains a pickup plate and each cell is connected).

As to claim 55, the combination of Tschudi and Raynal discloses a fingerprint sensing system as defined in claim 52, Raynal further discloses wherein each of said finger detectors

includes first and second rate pickup plates disposed on opposite sides of the rate drive plate to form a differential capacitive sensor (Fig. 2 and 3, wherein each cell contains a pickup plate and the cells in rows and columns meaning that the pickup plates are disposed on opposites of the drive plates).

As to claim 56, please refer to the rejections made for claim 54 above.

As to claim 57, the combination of Tschudi and Raynal discloses a fingerprint sensing system as defined in claim 52, Tschudi further discloses wherein the rate drive plates and the rate pickup plates of said finger detectors are curved to substantially match the curve of a typical finger end (column 3, lines 49-58).

As to claim 58, please refer to the rejections made for claim 8 above.

As to claim 59, please refer to the rejections made for claim 8 and 10 above.

As to claim 60, please refer to the rejections made for claim 12 above.

As to claim 61, please refer to the rejections made for claim 13 above.

As to claim 62, please refer to the rejections made for claim 16 above.

As to claim 63, the combination of Tschudi and Raynal disclose a fingerprint sensing system as defined in claim 60, both Tschudi and Raynal further discloses wherein said sensor circuit further comprises a processing circuit for detecting a time delay between said rate signals

from said finger detectors, wherein said time delay between said rate signals is representative of the speed of the finger (Tschudi, column 3, lines 20-28 and Raynal, column 4, lines 15-21).

As to claim 71, please refer to the rejections made for claim 69 above.

As to claim 72, please refer to the rejections made for claim 69 above.

As to claim 79, the combination of Tschudi and Raynal disclose a fingerprint sensing system comprising:

An image sensor comprising a linear array of capacitive sensors for capacitive sensing of ridge peaks and ridge valleys of a fingerprint on a moving finger (Tschudi, column 2, lines 6-10, column 4, lines 15-20 and lines 59-63 and Raynal, Fig. 2, element 21 and column 4, lines 40-56);

A rate sensor for sensing the speed of a finger as it moves across said image sensor (Tschudi, column 4, lines 15-20 and Raynal, column 3, lines 6-10), wherein said image sensor and said rate sensor are fabricated on a substrate (Tschudi, column 4, lines 15-20 and 59-63); and

A sensor circuit, separate from said substrate, for operating said image sensor and said rate sensor to provide fingerprint data (Raynal, Fig. 2, element 27 and 31).

As to claim 81, please refer to the rejections made for claim 1 above.

As to claim 82, please refer to the rejections made for claim 69 above.

As to claim 87, please refer to the rejections made for claim 79 above.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent Application Publication 2002/0067845 to Griffis discloses a method of detecting a fingerprint and speed of the finger.

USPN 6,320,394 to Tartagni discloses a capacitive distance sensor.

USPN 6,289,114 to Mainguet discloses a capacitive fingerprint sensor with adjustments made for the speed of a finger.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aaron W Carter whose telephone number is (703) 306-4060. The examiner can normally be reached on 7am - 3:30 am (Mon. - Fri.).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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